

WIRELESS INFASTRUCTURE TECHNICIAN CERTIFICATE



SOUTHEAST TECH

Southeast Technical Institute
2320 N Career Ave | Sioux Falls, SD 57107

New Program

Certificates in Wireless Infrastructure Technician

Telecommunications Tower Technician 1 Certification (TTT 1)

Telecommunications Tower Technician 2 Certification (TTT 2)



Spring 2020

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Wireless Infrastructure Technician Certificate

Executive Summary

Southeast Tech was approached by VIKOR Teleconstruction in the fall of 2018 to assist with meeting the ever-growing needs of the wireless telecommunications industry in South Dakota. VIKOR Teleconstruction, for over 30 years, has been the leading provider of wireless infrastructure in South Dakota. The need for a stronger wireless telecommunications workforce is even greater with the challenge presented by the Honorable Paul TenHaken, Mayor of Sioux Falls. Mayor TenHaken has established a Department of Innovation and Technology which has been charged with having Sioux Falls become a 5G connected city to support such initiatives as autonomous vehicles, adaptive traffic flow technology, mobile notification systems and many other innovative technology supported programs.

“This restructure will ensure we stay on the leading edge of smart city government.”

Mayor Paul TenHaken

Identification and Description of the Program

The Wireless Infrastructure Technician certificates will provide students with both the hands-on educational experience and necessary educational theory to receive certification as Telecommunication Tower Technician 1 and Telecommunication Tower Technician 2. Students will become skilled in basic rigging, fall protection, safety, fiber optics, wireless technology, cell components, antenna basics, principles of electricity, and spectrum management. Students who complete the TTT1 and TTT2 are eligible to continue their education and earn their Associate in Applied Science in Mechatronics.



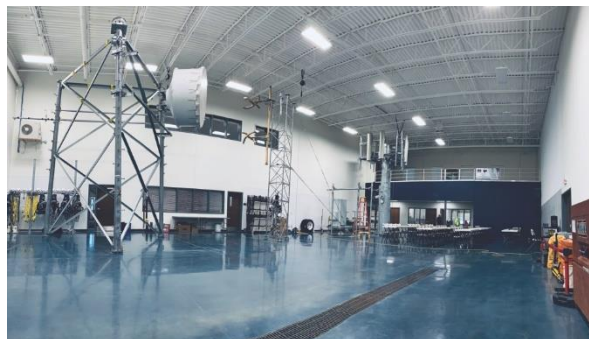
Objectives and Purpose of the Program

1. Understand and implement the fundamental aspects of fall protection and rescue theory and practical application to tower safety practices for a competent worker.
2. Identify and apply the basic principles of overhead tower construction including safe work habits, protective equipment and tower climbing techniques.
3. Identify, understand and apply the fundamentals of cable accessories and carrier installation standards for a broad cross section of wireless construction.
4. Identify, understand, and discriminate among the basic fundamental elements of wireless technology relevant to tower installation including wireless networks, application, service and a basic technical overview of spectrum principles.
5. Identify and apply the basic principles of electricity and safety standards. Choose and use basic tower installation tools at each job site.
6. Identify tower inspection and maintenance items from Current ANSI tower inspection criteria and apply those items to tower inspection fieldwork and reports.

Methods of Attaining the Objectives of the Program

Upon receipt of the South Dakota Board of Technical Education approval, Southeast Technical Institute will accept up to 30 students for the first class to begin in January 2020. The marketing campaign to recruit students will include web, print and radio spots as well as working with VIKOR and other tower installation companies.

The Wireless Installation Certificates will be offered traditionally in a partnership with VIKOR Teleconstruction. Students will attend classes at Southeast Technical Institute but meet lab requirements at the VIKOR facility. Courses will also be offered in hybrid formats. Southeast has been a laptop campus longer than any school in South Dakota, and all classes utilize the Learning Management System, providing students with resources during class and supplemental material and information outside of the classroom.



Description of Labor Market Demands in the United States and South Dakota

Employment Projections for Wireless Infrastructure Technician graduates in the area of Radio, Cellular, and Tower Equipment Installers and Repairers.

State/Regional Data

The South Dakota Department of Labor & Regulation does not have data for Radio, Cellular, and Tower Equipment Installers and Repairers. At present these positions are considered to be part of a new and emerging field of cellular tower construction. The technology being implemented is still in the development stages for use in cellular communications.

According to Todd Schlekeway, Executive Director for the National Association of Tower Erectors (NATE), he is estimating that South Dakota based companies could hire an additional 440 technicians over the next 5 years. In addition, regional companies in Northwest Iowa, Southwest Minnesota and Northeast Nebraska would have additional hires outside of the 440 technicians.

SD Bureau of Labor Statistics 2016 – 2026			
Position: SOC 49-2021	Employees 2016	Employees 2026	2016 – 2026 %
Radio, Cellular and Tower Equipment Installers and Repairers	No Data	No Data	No Data

National Data

According to the 2016 – 2026 National Bureau of Labor Statistics, there is an expected increase of 5.4% in wireless infrastructure technician employment. See Table Below:

National Bureau of Labor Statistics 2016 – 2026			
Position: SOC 49-2021	Employees 2016	Employees 2026	2016 – 2026 %
Radio, Cellular and Tower Equipment Installers and Repairers	14,500	15,300	5.4%

<https://www.onetonline.org/link/summary/49-2021.00#WagesEmployment>

SOC* - Standard Industrial Classification

Source: Labor Market Information Center from the South Dakota Department of labor Bureau of Labor Statistics and the U.S. Department of Labor

Student Needs

This program will provide students with an opportunity to enter an expanding industry that has many different entry points, areas for growth, and training that meets industry need. The majority of students will enter as a Tower Technician.

Industry Support

Southeast Technical Institute has consulted with VIKOR Teleconstruction, Senator John Thune, the Federal Communications Commission and the City of Sioux Falls and has received a strong level of support as indicated by the letters of support attached in Appendix B. These individuals have indicated they are not able to recruit enough Tower Technicians to meet their needs and in some cases are hiring untrained individuals and training in-house and on-the-job.

Population to be Served by the Program

This program will be available to all students who successfully meet Southeast Technical Institute admission criteria established for the program. No restriction will be made regarding race, creed, gender or age.

Southeast Technical Institute will recruit students from a variety of backgrounds including both traditional and non-traditional.

Program Enrollment

Starting Semester	Delivery Format	Capacity
Spring 2020	Traditional Day	30

Southeast Tech will start a cohort of 30 students in the Spring of each year. Scheduling of the certificates could include a fall start in the future. Southeast Tech plans to have students in the first or second certificate in the Fall and Spring semesters.

Projected Three-Year Budget Plan

BUDGET PROJECTIONS			
Year	2019 - 2020	2020 - 2021	2021 - 2022
Full Time Salaries/Benefits	\$0.00	\$0.00	\$0.00
Adjunct Faculty	\$25,000.00	\$25,000.00	\$25,000.00
Staff Travel	\$1,000.00	\$1,000.00	\$1,000.00
Instructional Materials	\$8,000.00	\$8,000.00	\$8,000.00
Equipment Purchases	\$25,000.00	\$15,000.00	\$6,000.00
Accreditation Fees	\$0.00	\$0.00	\$0.00
Training	\$5,000.00	\$2,500.00	\$1,000.00
Software/Books/Fees	\$0.00	\$0.00	\$0.00
Totals	\$64,000.00	\$51,500.00	\$41,000.00

Staff Certification

Southeast Tech will work with industry to hire qualified adjuncts for this program. The adjuncts will proceed through Southeast Tech's training and mentoring program, including certification as a faculty member for South Dakota Technical Institutes.

Salaries/Benefits/FTE/Equipment

Southeast Tech will utilize adjunct faculty to teach the program specific courses, lowering the cost of salaries and benefits. No Full-Time instructor will be hired for the program, so no FTE is budgeted.

Southeast Tech will need to procure safety and harness equipment, additional specialty tools and equipment. In addition, Southeast Tech will work with industry to leverage equipment, tools and supplies for the programs.

Program Competencies and Entry and Exit

Program Competencies

1. Understand and implement the fundamental aspects of fall protection and rescue theory and practical application to tower safety practices for a competent worker.
2. Identify and apply the basic principles of overhead tower construction including safe work habits, protective equipment and tower climbing techniques.
3. Identify, understand and apply the fundamentals of cable accessories and carrier installation standards for a broad cross section of wireless construction.
4. Identify, understand, and discriminate among the basic fundamental elements of wireless technology relevant to tower installation including wireless networks, application, service and a basic technical overview of spectrum principles.
5. Identify and apply the basic principles of electricity and safety standards. Choose and use basic tower installation tools at each job site.
6. Identify tower inspection and maintenance items from Current ANSI tower inspection criteria and apply those items to tower inspection fieldwork and reports.

Entry and Exit Points

Entry point: Starting in the Spring 2020 semester. Entry will happen at the start of the spring semester each academic year and Southeast Tech will also look at fall starts.

Exit point: Graduation with a certificate after one semester.

Statement of Non-Duplication

The Wireless Infrastructure Technician certificates are new academic programs which are not offered by any of the Technical Institutes in South Dakota.

Wage Factor

Data from the South Dakota Department of Labor Occupational Wage Estimates for 2018 positions annual starting wage range from \$15.15 to \$19.52 for the 10th to 25th percentile. The average wage for 2018 was \$16.75. See Table Below:

South Dakota Department of Labor Occupational Wage Estimates 2018 Data SOC 49-2021			
Occupation	2018 Avg Wage	10 th Percentile	25 th Percentile
Radio, Cellular and Tower Equipment Installers and Repairers	\$16.75	\$15.15	\$19.52

Data from the National Department of Labor Occupational Wage Estimates for 2018 positions annual starting wage range from \$21.25 to \$27.50 for the 10th to 25th percentile. The average wage for 2018 was \$26.39. See Table Below:

National Department of Labor Occupational Wage Estimates 2018 Data SOC 49-2021			
Occupation	2018 Avg Wage	10 th Percentile	25 th Percentile
Radio, Cellular and Tower Equipment Installers and Repairers	\$26.39	\$21.25	\$27.50

Suggested CIP Code

CIP Code: 47.0103

Title: Communications Systems Installation and Repair Technology

Definition: A program that prepares individuals to apply technical knowledge and skills to assemble, install, operate, maintain, and repair one- and two- way communications equipment and systems, including television cable systems and mobile or stationary communication devices. Includes instruction in diagnostic techniques, the use of testing equipment and the principles of mechanics, electricity, and electronics as they relate to the repair of communications systems.

Appendix A – Curriculum Design

Wireless Infrastructure Technician

This program will allow students to earn a certificate for entry level positions as a Tower Technician with a TTT1 Certificate and a TTT2 Certificate.

TTT1 Certificate

Course #	Course Name	Credits
WIT 110	Site Safety Practices and Procedures	3
WIT 120	Wireless Technology and Structures	3
WIT 130	Wireless Site Operations	3
WIT 140	Regulations, Standards and Professionalism	2
	Total Credits:	11

TTT2 Certificate

Course #	Course Name	Credits
WIT 150	Advanced Topics for Wireless Infrastructure Construction	3
WIT 160	Advanced Climbing & Rigging Techniques	3
WIT 170	Site Management Techniques	3
BUS 218	Project Management	3
	Total Credits:	12

Program Course List with Descriptions

TTT1 Classes:

WIT 110 – Site Safety Practices and Procedures

3 Credit Hours Co-requisites: WIT 120, WIT 130 & WIT 140

This course focuses on practical application of working at heights using various methods of fall protection, especially use of the Personal Fall Protection System, Rope Access techniques, and rescue systems. Other topics include: emergency response, dropped objects, electricity and electrical safety, “struck by/”caught between”, radio frequency (RF) energy, ladders, excavations, heavy machinery, traffic control, hazard identification and mitigation, and situational awareness

WIT 120 – Wireless Technologies and Structures

3 Credit Hours Co-requisites: WIT 110, WIT 130 & WIT 140

This course introduces the fundamental elements of wireless technology including cellular, microwave and broadcast antenna systems and the structures that support them. Coursework will provide practical application of installation of shelter-based radio equipment, batteries, grounding, feedlines and connectors, tower-top signal and power distribution and radio equipment, antenna mounts and antennas. Other topics include: basic technical overview of wireless networks, spectrum principles and characteristics, antenna system testing instruments and procedures, basics of tower structure design, construction and maintenance and aviation marking/lighting systems.

WIT 130 – Wireless Site Operations

3 Credit Hours Co-requisites: WIT 110, WIT 120 & WIT 140

This course introduces the fundamental tools, machinery, methods and skills required for efficient and safe work on Wireless Antenna Sites. Coursework will provide practical application of rigging equipment to lift loads and personnel, rigging plans, equipment operation, Commercial Motor Vehicle driving, power tool usage and hand tools.

WIT 140 – Regulations, Standards and Professionalism

3 Credit Hours Co-requisites: WIT 110, WIT 120 & WIT 130

This course introduces the ANSI/ASSE A10.48 standard for work on communication structures as well as an overview of other principal standards and regulations governing the industry. Coursework will provide practical application of blueprints, installation drawings, rigging plans, close-out packages, site access protocols, computer and mobile device usage, communications, and professionalism. Students will prepare for and earn the NWSA TTT1 credential.

TTT2 Classes:

WIT 150 – Advanced Topics for Wireless Infrastructure Construction

3 Credit Hours Co-requisites: WIT 160& WIT 170 Pre-requisites TTT1 coursework

This course presents students with deeper understanding of their TTT1 course work to the level of a supervisor of TTT1 workers. Students will prepare for and earn the NWSA TTT2 credential.

WIT 160 – Advanced Climbing and Rigging Techniques

3 Credit Hours Co-requisites: WIT 150 & WIT 170 Pre-requisites TTT1 coursework

This course presents students with deeper understanding of climbing and rigging including areas of fall protection, rescue, personnel platform techniques, and advanced rigging techniques and background.

WIT 170 – Site Management Techniques

3 Credit Hours Co-requisites: WIT 150 & WIT 160 Pre-requisites TTT1 coursework

This course covers all aspects of site safety starting with pre-climb inspections, site planning, identification and inspection of the site, working with specialty equipment and overall site management.

BUS 218 – Project Management

3 Credit Hours

This course focuses on how projects contribute to the strategic goals of the organization. It covers the concepts and skills that are used by managers to propose, plan, secure resources, budget, and lead project teams to successful completion of their projects. Project management software tools will be an integral part of the course.

Appendix B - Letters of Support

The Honorable John Thune, US Senator to South Dakota

Chairman

Commerce Committee's Subcommittee on Communications, Technology, Innovation, & the Internet

Brendan Carr

Commissioner

Federal Communications Commission

Craig M. Snyder

Chief Executive Officer

VIKOR Teleconstruction

Todd Schlekeway

Executive Director

National Association of Tower Erectors

United States Senate
WASHINGTON, DC 20510-4105

August 2, 2019

Nick Wendell
Executive Director
South Dakota Board of Technical Education
South Dakota Department of Education
800 Governors Drive
Pierre, SD 57501

Dear Mr. Wendell:

Technology advancements are impacting the lives of Americans in ways many of us could never have imagined. Deploying modernized broadband infrastructure to make those advancements available throughout America and here in South Dakota has never been more important. I applaud Southeast Technical Institute (STI) for developing its proposed Wireless Infrastructure Technician certification program that would help train the workforce needed to deploy fifth-generation (5G) wireless services.

5G is expected to contribute \$275 billion in new American investment, \$500 billion in economic growth, and create three million new jobs. Winning the race to 5G requires world-leading technology, spectrum, and the ability to deploy and build-out wireless services. Cell tower climbers and technicians specialize in the maintenance and installation of cell tower components. It is estimated that over 800,000 small cells will need to be deployed nationwide to support 5G networks. It is crucial that all states have the workforce to meet those needs.

I am excited to watch how emerging technologies will continue to take shape. States like South Dakota can play a leading role in the technological revolution, and I appreciate STI's commitment to helping ensure that we have the necessary workforce to deploy and build 5G services in South Dakota.

Sincerely,



JOHN THUNE
United States Senator

Cc: Mr. Robert J. Griggs, President, Southeast Technical Institute



Federal Communications Commission
Washington, D.C. 20554

Brendan Carr
Commissioner

August 15, 2019

Nick Wendell
Executive Director
South Dakota Board of Technical Education
South Dakota Department of Education
800 Governors Drive
Pierre, SD 57501

Dear Mr. Wendell:

The U.S. is in the midst of a transition to 5G, which is the next generation of wireless connectivity. 5G is more than just faster Internet speeds—it is a massive new infrastructure build that will power everything from smart cities to precision agriculture. To enable 5G, the private sector is working to increase the number of cell sites in the U.S. by 10 to 100 fold.

At the FCC, we have been working to accelerate the buildout of 5G infrastructure—everything from the thousands of new cell towers to the hundreds of miles of new fiber builds needed to connect these sites. These efforts and the private sector's investments have been delivering results. In the U.S., more fiber was built last year than ever before, and 60,000 small cells were deployed in 2018—a massive increase from the 17,000 deployed in 2017. In fact, industry estimates that over 800,000 new small cells will need to be built by 2026, not to mention the tens of thousands of additional cell towers and upgrades to existing structures that will be required to transition to 5G.

But all of this growth highlights a new challenge and opportunity: how do we ensure that South Dakota and the rest of the country have the skilled workforce in place to build these next-gen networks.

That's where a Wireless Infrastructure Technician certification program like the one Southeast Tech is considering could make a significant difference—it can create a pipeline to good-paying jobs building out this 5G infrastructure.

The data show the significant demand for tower techs and the challenges that employers face in filling these jobs. Across the country, wireless crews estimate that they need an additional 20,000 skilled workers to complete this 5G build. That would nearly double the size of this group of skilled workers, bringing thousands of families into the middle class. In South Dakota alone, tower companies estimate they can hire an additional 440 tower technicians over the next five years to meet current and future demand. And as Sioux Falls is a hub for wireless

deployments in Northwest Iowa, Southwest Minnesota, and Northeast Nebraska, those communities will present new job opportunities as well for South Dakota tower techs.

Tower climbing is not just a one-off job, it's a career with a clear pathway for upward mobility. Nationwide, the average wage for an entry-level tower tech ranges from \$15-\$20 an hour, and that figure quickly jumps to \$22-\$25 with just a few years of experience. For those who go on to become a crew leader or foreman, they can make anywhere from \$26 to \$38. And I've met with several tower climbers who started out as tower techs and went on to become CEOs of their respective companies.

Spending time with tower techs and telecom crews across the country has only reinforced the need for programs that can train more 5G workers. In Cincinnati, Ohio, I met with a company that has doubled the number of small cells they're putting up from 30 to 60 a month, and they recently hired four new crews to keep up with demand. In San Jose, California, I met with a worker who has been climbing towers for seven years. He now wants to double the size of his crew but is struggling to find enough workers. In Lewisville, Texas, I met with one company that had more than 500 openings for tower techs they were looking to fill.

Every crew I've met with agrees that having more tower training programs, like the one proposed by Southeast Tech, would reduce training time and churn and free up thousands of dollars that can be put toward other purposes like hiring more workers and deploying more infrastructure. So I'm pleased to write in support of Southeast Tech's initiative.

Southeast Tech's program would be modeled on the Tower Installation Program at Aiken Technical College in South Carolina. Their seven to twelve-week program trains students in accordance with the standards and internationally-recognized certifications, including "TTT-1," established by the National Wireless Safety Alliance. This program can provide the right mix of physical and classroom skills to land a good-paying job in this field. I understand nearly 100 percent of the Aiken program's graduates are placed with a local tower company, with the vast majority receiving job offers even before they graduate. Establishing a program of this kind at Southeast Tech will address South Dakota's need for more 5G-ready workers and help close the skills gap in wireless infrastructure.

5G is estimated to require \$275 billion in investment, adding \$500 billion in economic growth and creating three million new jobs. South Dakota has a vital role to play in this effort and creating a pipeline for 5G jobs at Southeast Tech will help ensure we have the necessary workforce to deploy next-gen networks across the state. I strongly support Southeast Tech's proposed Wireless Infrastructure Technician certification program and look forward to seeing South Dakota reap the benefits of a more robust wireless workforce.

Sincerely,



Brendan Carr
Commissioner
Federal Communications Commission



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August 14, 2019

Nick Wendell, Executive Director
South Dakota Board of Technical Education
SD Board of Education
800 Governors Drive
Pierre, SD 57501

Re: Letter of Support for STI's Wireless Infrastructure Technician program

Dear Mr. Wendell and South Dakota Board of Technical Education Members,

We are strongly in support of the Wireless Telecommunications Technician program being proposed by Southeast Tech and recommend the board's approval.

By way of background, VIKOR Teleconstruction is one of the leading providers of wireless teleconstruction services in the state of South Dakota with offices in Sioux Falls and Rapid City. We perform work for all the major carriers such as Verizon, AT&T, T-Mobile and Sprint. We also provide similar services for radio, television, public safety, and other related industries.

At present our industry relies on training from within our own organizations. There are no trade programs within the state and only one nationally in South Carolina that we can rely on for recruitment of trained individuals. We spend roughly \$12,000 per person on training within the first six months of employment. A qualified individual is capable of earning upwards of \$70,000 annually in their first year of employment. Industry demand for wireless telecommunications technicians is high and has been steady for several years. With 5G technology in its early stages, the demand will only grow from here. VIKOR estimates the need for 45 technicians per year for the foreseeable future. And we are just one employer in the state.

Furthermore, STI has the opportunity to be leaders in the nation in this emerging trade. With the recent release by the National Wireless Safety Alliance of wireless technician trade credentials, it is perfect timing for the school to train to these nationally recognized standards and have the potential to attract students from far and wide.

Our company is only limited in growth by the number of qualified individuals we can bring on board. We strongly encourage approval of STI's proposal and stand ready to place as many of the certified students as we can. If I can answer any other questions, I'm happy to do so.

Sincerely yours,

A handwritten signature in black ink that reads "Craig M. Snyder". The signature is written in a cursive, flowing style.

Craig M. Snyder
Chief Executive Officer





National Association of Tower Erectors

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August 14, 2019

Nick Wendell, Executive Director
South Dakota Board of Technical Education
SD Board of Education
800 Governors Drive
Pierre, SD 57501

Dear Mr. Wendell and South Dakota Board of Technical Education Members:

The National Association of Tower Erectors (NATE), a South Dakota-based national trade organization in the wireless infrastructure industry whose membership consists of over 900 member companies, offers our full endorsement and support for the Wireless Infrastructure Technician Program that is under development at Southeast Technical Institute in Sioux Falls, South Dakota. The Association encourages the South Dakota Board of Technical Education to formally approve this program in an expedient manner.

NATE's member companies know firsthand that one of the significant challenges facing the industry is the shortage of a properly trained and qualified workforce that is expected to possess the diverse skill set necessary to produce the expansion of universal broadband, public safety communications and ubiquitous 5G coverage across South Dakota and the United States. To demonstrate this point, NATE estimates that the industry could employ an additional 20,000 technician jobs to meet this demand nationally. To extrapolate this further, the Association believes that our member companies located in South Dakota could accommodate an additional 440 wireless technicians over the course of the next 5 years.

Given the robust nature of the industry, workforce development has emerged as a top priority and the Association is encouraging community colleges and technical institutes to develop classroom and field-based programs to educate and train a future pipeline of workers to build, deploy and maintain the next generation networks and related-infrastructure that is so vital for the city, state and country's future. NATE believes that the Wireless Infrastructure Technician Program at Southeast Technical Institute will ultimately serve as a model to emulate nationally in order to promote the professional career path opportunities available in our thriving industry.

In summary, NATE strongly supports the Wireless Infrastructure Technician Program at Southeast Technical Institute and believes it will be a successful, in-demand program that will ultimately benefit both technical education and employers in the region. Please feel free to contact me directly with any additional questions you may have regarding NATE and our industry.

Sincerely,

Todd Schlekeway
Executive Director

Your Partner in Safety, Standards, and Education.